

RESEARCH ARTICLE

Assessing Pre-Service Teachers' Teacher Identity through Eportfolio

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ABSTRACT

Teacher identity has been an important topic in understanding teachers' beliefs and behavior. With the emergence of technology in teacher education, teachers start articulating their identity in non-traditional ways, as eportfolio provides a platform for teachers to express their identity in the artefacts in electronic forms. In this paper, we developed a rubric to assess teacher identity and presented data from seven eportfolios constructed in two different contexts – learning journey during teacher training and teaching practice during teaching practicum – to investigate the utility value of our rubric in assessing teacher identity as reflected in their eportfolio artefacts and determining the nature of their teacher identity development. Using seven student teachers' eportfolios as examples, we tried to understand the ways they developed their teacher identity in different contexts using the rubric.

Key words: Teacher Identity; Eportfolio; Rubric; Pre-service Teachers; Dialogical Approach

INTRODUCTION

Teacher identity has been an important topic in understanding teachers' beliefs and behavior. In general, it indicates how one identifies with being a teacher and how one feels as a teacher [20]. It is based on one's core beliefs about teaching and being a teacher; beliefs that are continuously formed and reformed through experience. Such a view promotes the teacher as a flexible, lifelong learner, who is able to participate in ongoing change and stays confident in him/herself [30]. With the emergence of technology in teacher education, teachers start articulating their identity in non-traditional ways, as eportfolio provides a platform for teachers to express their identity in the artefacts in electronic forms. The analysis of their artefacts, hence, allows us to sense their identity construction. In order to assess their teacher identity as reflected in eportfolios, a well-developed rubric is necessary.

In this paper, we developed a rubric to assess teacher identity and presented data from seven eportfolios constructed in two different contexts – learning journey in teacher training institution and teaching practice during teaching practicum – to determine the nature of their teacher identity development. We adopted a dialogical approach in the rubric development as it offers a more inclusive conceptualisation of this construct [1]. The main purpose of the study was to investigate the utility value of our rubric in assessing teacher identity as reflected in their eportfolio. Additionally, we were also interested in understanding how, whether, and in what ways pre-service teachers developed their teacher identity in different contexts.

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2. Objectives:

2.1 A dialogical approach to teacher identity:

Albeit the diverse perspectives in understanding teacher identity, the general consensus is that it is dynamic in nature rather than stable; something that is fluid and constantly evolving [4]. Just as Hall [11] argued, teacher identity is ‘not already “there”’; rather, it is a production, emergent, in process’ (p. xi). Therefore, we take the view that defining teacher identity as what it is or what it constitutes does not fully reflect its dynamic nature; rather, we need to consider more the multi-dimensions that co-define the existence and evolution of teacher identity.

In a dialogical approach, interaction and context are key concepts in the study of all kinds of meaning-making processes [19]. A person’s conception of the world is located in between the person and what exists in the situation. This enables people to enter into dialogue with others and engage in the process of constructing different selves [25]. The construction of selves involves the coordination, management, and negotiation of different voices that we can use in expressing our self to others [14]. Linell [19] interprets voice as ‘an expressed opinion, view or perspective, something that the person would typically say and presumably stand for’ (p. 116). It can take different forms such as a text message on a mobile phone, a reflection note posted on the website, or a conversation between a teacher and students in classroom. When people participate in different situations, they find themselves in dialogue with multiple voices created in tension between different persons and different sociocultural practices. Meaning-making occurs when different voices get in touch with one another [32]. Selves will emerge through these dialogical relationships across ‘trajectories of participation’ [10].

Along this line, we adopted Akkerman and Meijer’s [2] dialogical model to examine the different dimensions of teacher identity and how the dimensions interact to affect its construction, maintenance, and development. Drawing on Wertsch’s [32] dialogical views on identity, Akkerman and Meijer [1] argued that dialogical approach towards teacher identity sees the co-existence of the three common characteristics of teacher identity with their counterpart (multiplicity-unity, discontinuity-continuity, social-individual nature of identity) rather than as a continuum with two extreme ends. Such a view allows us to move from a theoretical discussion in terms of either/or towards thinking in terms of both/and.

The idea of multiplicity is related to teachers’ different contexts and relationships [5]. In the teaching context, teachers are often required to juggle between different roles (e.g., subject teacher, mentor, and supervisor). Such multiplicity of teacher identity sheds light on the way teachers face dilemmas and resolve the tension between the multiple and sometimes conflicting roles. However, the multiplicity characteristic does not necessarily deny the aspect of unity [23]. In fact, those positions are constantly shifting and moving for temporary dominance, with an inherent desire to maintain a coherence of identity.

One’s teacher identity does not only change from moment to moment, but also concerns with the type of situation one finds oneself in and to whom one is facing. Therefore, one’s responses at that particular moment may not reflect the usual he or she; but based on the situation. In the teaching context, a teacher may regard lecturing less than ideal, nonetheless, he/she still acknowledges the necessity of giving mini-lectures to bottom students to build a solid knowledge base before moving on to more advanced topics. This is captured by the concept of discontinuity of teacher identity which is a “break-away” from the usual one due to situational needs. Yet teachers can still maintain the coherence sense of their identity across temporal spectrum, despite the temporary “break-away”, reflecting the continuity nature of teacher identity [1]. In the previous example, the teacher could still stick to his/her student-centered lesson throughout the semester with a few mini-lectures.

Last, the social nature of the teacher identity taps on the impact of social environments. Interactions with the environment are not necessarily be in agreement whereby one accepts the impact and integrate or assimilate into one’s teacher identity; showing the part of what I am not is also considered as part of such impact. In the teaching context, a beginner teacher often benefits from the feedback from other senior teachers. Such input sometimes changes his/her own views and beliefs as an educator, yet he/she may still be able to maintain a unique sense of teacher identity by critically evaluating such input and producing reasons to accept or reject it. This is what individuality of teacher identity concerns with.

2.2 Teaching identity as reflected in portfolios:

In recent years, teaching portfolios are gaining prominence in teacher education programmes around the globe. The portfolios have been said to be an effective tool for developing teacher identity [17], as they provide a context for student teachers to discover, document, formulate, debate and reflect upon the thoughts and beliefs about teaching and highlight the tensions student teachers might confront as they represent themselves within negotiations of their identity, text and context [2,12]. Wenger [31] argued that engagement in practice is an important source of identification because it allows us to ‘gain a lived sense of who we are’ (p. 192). Engagement with the eportfolio, through uploading, sharing, viewing, receiving feedback, and ultimately making decisions about the planning and delivery of lessons, contributed to the construction of the teachers’ identities [28]. The authentic settings provided by eportfolios wherein multiple sources of evidences were collected to portrait oneself as a teacher consist of snapshots of one’s ongoing teaching and learning experience.

Those entries and documentation “serve as the vehicle for demonstrating progress in an ongoing and personal way” [3]. In this way, the experience and display of competence necessary for engaging with the eportfolio represented one means for the reification of the individuals’ identities they desired to be.

Although student teacher portfolios serve as a window into the emergent identity of beginning teachers [2], eportfolios have not been widely investigated as sites to explore the complexities of identity negotiation within digital text [12]. There have been only a few studies that involved eportfolios as a platform to develop teacher identity. For example, Klecka, Venditti, Donovan, and Short’s noted that the teacher educators enacted their identities through the development of their eportfolios predominantly via standards, which provided a vision for who they were and who they wanted to become. However, at the same time, they indicated that the eportfolios may or may not fully represent the identities that they intended to construct, because of the medium through which they were enacted. Using in-depth interviews, Trent and Shroff [28] interviewed pre-service teachers to gain an understanding of how the construction of their identities as teachers was shaped by their engagement with electronic teaching portfolios. Their study highlighted the identity struggles that participants confronted in using eportfolios to negotiate their own and others’ professional identities within their teaching practicum placement schools. On one hand, eportfolio acted as one means of reifying the identity of ‘modern teacher’; on the other hand, the poor technology skills exhibited through eportfolios also labelled one as a “traditional or low tech teacher”.

Unfortunately, none of these studies attempted to assess teacher identity as a multidimensional construct. Traditional ways of assessing one’s teacher identity tend to follow a dichotomy such as positive versus negative [6], mature versus naïve [15], or different types of teachers. Given the assumption that teacher identity is developmental in nature, in the current research, we used the dialogical approach to assess teacher identity as a dynamic and multi-dimensional construct.

2.3 Present study:

The identity of the teacher is vital to the education of future teachers as the basis for the formation of meaning and exercise in decision-making [8]. The process of exploring their teacher identity would assist student teachers to understand themselves as teachers, relate this understanding to their own practice, reflect critically on the teaching decisions they make and monitor their own development and growth as future teachers [18]. Albeit the extensive coverage in the literature, the understanding and conceptualisation of teacher identity is still very much in the theoretical discussion stage and there is a lack of effective assessment tools to operationalise this construct. This study responds to Klecka *et al.*’s [16] call for research on how (prospective) teachers perceive themselves in relation to the identities that they represented in their eportfolios, and how they represented who they are through the eportfolio document and the standards. Grounded upon Olsen’s idea of teacher identity development, we located teacher identity inside “a collection of narratives or reflections about one’s teaching beliefs and experiences” in the present study, which constituted the data for developing the rubric. This sociocultural perspective considers that individuals can choose to act in certain ways that are not only considered by them to be coherent with their own self-understandings but also determined by their sociocultural contexts. Applied to teachers, this view highlights both the constraints and opportunities on a teacher deriving from personal historical events, when he defines his teacher identity.

Various efforts have been made to measure or assess teacher identity. Some explored this construct using narratives to describe teachers’ roles and lives to detect identity [24], and some employed metaphors produced by teachers based on their understanding of a teacher’s role [18]. Although these qualitative approaches reveal teacher identity from different angles, they are limited in scope and applicability to a different sample. Thematic coding with an emphasis on extracting themes was inadequate for our purpose because students’ perceptions of their identity as teachers could not be determined with such a method. Similarly, qualitative analysis was deemed insufficient because of its inability to provide focused differentiation of teacher identity development levels. Alternative ways of measuring teacher identity involve self-reports that measure elements contributing to one’s teacher identity [26]. We believe the pre-determined wording in the items frames respondents’ thinking to a large extent and the administration of the instrument at selected time points fails to capture the development process of teacher identity.

Hence, we sought to develop analytical rubrics, a theory-based delineation of dimensions or levels of a construct [29]. They were deemed to be the best choice for assessing teacher identity because they are based on a theoretical framework and can be tailor-made for specific purposes. Such a rubric delineates the various dimensions or levels of an assessed construct, defining benchmarks for each, and can yield quantitative scores, which can be used for both formative and summative purposes. By examining the reflective narratives in student teachers’ eportfolios, which are crucial resources for learning, thinking, and identity formation [7], the purposes of our study are two-fold: (a) to test the efficacy of a rubric for assessing pre-service teachers’ teacher identity and (b) to assess teacher identity across time and contexts using the rubric.

Methods:

3.1. Rubric Development:

Guided by Timmerman, Strickland, Johnson, and Payne, we collected evidence from different sources to examine the validity of the criteria in the rubric. First, we conducted a review of the relevant literature prior to the construction of the rubric and continued throughout the process of rubric development. Akkerman and Meijer's framework was deemed to be appropriate in that it captured core values of teacher identity, and their dialogical approach lays a good foundation to seek operational evidence of each dimension of the construct. Second, direct correspondence between the authors and the theorists of this framework clarified the key concepts used in this rubric and further refined the criteria in our rubric. Third, Moskal and Leydens argued that assessment tools should be evaluated in terms of the intended purpose of the tool. Thus, as this instrument is intended to help with our understanding of pre-service teachers' identity, the vast proportion of its validity derives from whether or not the intended end users (e.g., teacher educators) believe the rubric to be appropriate and effective in its scope and specifications and whether or not the scores generated by the rubric appear to provide meaningful information about pre-service teachers' identity. Hence, multiple rounds of recursive feedback were sought from experts in teacher education, who were asked to feedback on whether or not the criteria represented valid and meaningful understanding of the construct and whether or not the different levels differentiated teacher identity along the same dimension. Such recursive examination and consultation with experts is a common method of constructing group consensus concerning ill-defined constructs [9].

3.2 Direction of using the rubric:

The process of applying the rubric to eportfolio artefacts consists of four steps (adapted from Wald *et al.*, 2012):

- (1) Read the entire artefact and identify if there is any information (evidence) that reveals the author's identity.
- (2) Zoom in to details of the artefact to assess the presence and quality of all criteria to determine which level each criterion represents.
- (3) Zoom out to consider overall gestalt of the artefact (while taking into consideration the detailed analysis of Step 2) and determine which level the artefact as a whole achieves.
- (4) Defend the assignment of level with examples from the artefacts.

Our intent for this rubric was to assess teacher identity as reflected by the eportfolio artefacts, so the criteria in the rubric were derived from the content of the actual artefacts. The rubric contains six dimensions: multiplicity-unity, discontinuity-continuity, and social-individual nature of identity. For each dimension, we identified four levels of teacher identity development. Level one is identity absence, wherein the pre-service teachers have not constructed their identity yet. The missing evidence of each dimension of teacher identity shows that their identity is either unclear or undeveloped. Level two is identity emerging, wherein the pre-service teachers start to show their identity formation. Level three is identity building, wherein the pre-service teachers are beginning to build their identity along that dimension. Level four is identity realisation, wherein the student teachers fully construct their identity. These four levels represent the inclination of strength of that particular dimension, with criteria that reflect increasing quantity and quality of the evidences.

As Akkerman and Meijer noted, all the dimensions can co-exist at the same time. Thus, each student teacher being rated on the six dimensions of teacher identity would receive a score for each dimension, with a total of six scores at the end. A numerical score is assigned to each level based on the strength of that identity; score "0" for identity absence, "1" for identity emerging, "2" for identity building, and "3" for identity realisation. As an example for the multiplicity dimension of identity, a quote from a student's eportfolio of "I believe teaching is all centering around how to help students to become independent learners." would be scored as "0" for the missing evidence of identity. A quote of "I believe teaching is not only concerned with how to help students to become independent learners, but sometimes also with how to let students know more about themselves." would be scored as 1 for the emerging evidence of identity. A quote of "I believe teachers are not solely knowledge transmitters; they are also delivering values to students on how to be good people." would be scored as "3" for the stronger evidence of identity. A quote of "Teachers are students' mentors to teach them knowledge and skills required in future; teachers are students' tour guides to show them different paths to achieve their goals; teachers are students' friends to share their happy and rough moments." would be scored as "4" for the full evidence of identity. All these six scores will be summed up with a maximum score of 18. The higher the score, the stronger orientation in that dimension. We would like to stress that the numeric scores provide an alternative indication for the overall view of the teacher identity. Still, the users should not overlook the individual score of each dimension. For example, two artefacts that both yield "12" for the total score might have very different individual dimension scores, as each dimension may manifest differently in strength. The researchers and research assistant completed scoring rubrics individually and then compared and discussed ratings to establish benchmarks for each dimension of teacher identity.

3.3 Background of the study:

Eportfolios were initiated in the Postgraduate Diploma in Education programme at National Institute of Education (NIE) in Singapore. The student teachers enrolled were explicitly informed that they need to develop a developmental eportfolio with the purposes of: (1) charting their learning and personal growth through their experiences at NIE; and (2) helping to bridge the theory-practice nexus in their learning and classroom teaching. Although the eportfolios were not graded, they all took a short course on how to construct an eportfolio and use reflective writings to assist with their growth when they started the programme.

An eportfolio template was designed which contained three essential components: 'my teaching philosophy', 'learning journey', and 'teaching practicum'. The teaching philosophy included the artefacts that reflected student teachers' general perceptions and thoughts regarding teacher and teaching. The learning journey section was developed to record, reflect and showcase their academic achievement. The teaching practicum section allowed the student teachers to collect useful teaching resources, reflect upon their teaching practices and build connection to what they learn to their classroom teaching. The purpose of this semi-structured template was to allow student teachers to voice out in the ways they wished to. The student teachers could further customise the template to better meet their needs and purposes. Based on the programme timeline, student teachers embarked on a 10-week teaching practicum attached to a junior college after they completed coursework. The free open source "Google Sites" was adopted for the eportfolio construction.

3.4 Participants:

With the rubrics, we conducted a case study in eportfolios from seven volunteer student teachers (five males and two females). Informed consents were sought in written forms from all the participants before the study started, under the guideline of ethical approval granted by the relevant institutional ethics committee. Content analyses were conducted on teaching philosophy, learning journey, and teaching practicum sections in the eportfolios, as they were consistent across participating student teachers and presented major contexts during their training at two different time points. Using the rubric, all the artefacts in each section were assessed by two independent researchers. There was substantial agreement in their ratings ($\kappa = .63$). Differences in interpretation of criteria were solved by further discussions and refinement of the criteria.

4. Findings from teaching portfolio:

4.1 Teaching philosophy:

We used participants' initials for our presentation and discussion of the findings (see Table 1). Analyses from participants' teaching philosophy revealed the multiplicity nature of identity in six of seven student teachers (with a mean score of 2). Often, student teachers used analogy to demonstrate their understanding of a particular issue by emphasising the similarities between the two perspectives. When student teachers noted different perspectives yet at the same time able to identify a core perspective that represented him/her well for that moment, the unity nature of identity was reflected. However this was not found to be common among the participants, with an average score of only 0.86. Below is one quote from HF that reflected the co-existence of both multiplicity and unity, wherein the analogy of a teacher to a musician shows the multiplicity nature yet they are not conflicting in the way they operate:

There are some musicians who choose to adopt a very slow tempo for a fast musical piece because they have no interest in the musical piece. Similarly, there are some students who are slow-learners and usually under the lime-light for "under-achieving". They may also not see the purpose of studying or learning in school. Good teaching is like providing a new and interesting interpretation of a musical piece so as to enthuse the musician..... [HF]

Six of the seven student teachers did not show any sign of discontinuity in their teaching philosophy. JY was an exception who showed emerging evidence in this dimension. He broke away from his usual beliefs of setting academic excellence as a goal but turned towards students' holistic development by recognising that not all students were capable to excel academically, who could still succeed in life.

I am aware that students have their individual strengths, and they are not necessarily in the subject areas prescribed by education system.... Sometimes the situation is really that we are teaching and assessing the students things that might be too challenging for them; hence, there is a need for the teacher to educate students to be resilient... [JY]

On the other hand, JL, who reflected upon his teaching beliefs, showed continuity of his teacher identity. The guidance he received when he was a student and his wish to contribute back as a teacher by becoming part of the cycle of giving and receiving delineated his identity. The continuity nature of teacher identity was also found in the other two student teachers.

Why do I teach? I have benefited much from the education system. I had many good teachers who guided me along the way. Therefore, I would like to contribute back to the system I had benefited from. [JL]

Four student teachers mentioned the impact of others (NIE tutors, school mentors) on forming their teacher identity. Although not thoroughly articulate, they showed the emerging evidence of it:

Education prepares one for what lies ahead in the working world. My NIE tutor once joked that as JC (junior college) tutors we are at the end of the assembly line (the students are being placed in the analogy as products) and these products will be out in the market to be tested soon. Though crude, it did make sense. [JY]

None of the participants exhibited the individual nature of their teacher identity, possibly due to the lack of critical reflections on the external input or lack of knowledge and skill to produce reasons to accept or reject it.

4.1 Learning journey:

When the student teachers positioned themselves as “students”, teacher identity was mostly absent. One of the possible reasons was the incomplete artefacts uploaded to their eportfolios. Another possible reason could be the lack of thought given to the question of “what does being a teacher mean to me?” In their teaching philosophy, this question can be directly addressed, yet during teacher training, the identity seemed not to be as strongly reflected as it was supposed to be. JY was the only one whose teacher identity was fully realized in many dimensions. The quote below showed an example of a full realization of the continuity and discontinuity of his identity by adopting appropriate teaching approaches to meet different needs of students:

My personal approach to discipline is an eclectic blend of principles and approaches ... Such an orientation is decided as I feel that there are components which suit my teaching style and beliefs. In addition, students are of diverse personalities and come from diverse backgrounds. Subscribing to one discipline model might not yield satisfactory results as different students might respond differently to the approach. [JY]

Table 1: Ratings for seven student teachers using the rubric.

Subject	Eportfolio component	Multiplicity	Unity	Discontinuity	Continuity	Social	Individual	Total
JY	Teaching Philosophy	R	B	E	A	B	A	8
	Learning	R	B	R	R	R	B	16
	Teaching	A	E	E	E	R	E	7
JL	Teaching Philosophy	R	E	A	B	A	A	6
	Learning	A	A	A	A	A	A	0
	Teaching	B	A	A	R	B	A	7
YZ	Teaching Philosophy	E	A	A	E	E	A	3
	Learning	A	A	A	A	A	A	0
	Teaching	E	A	A	A	E	A	2
PN	Teaching Philosophy	A	A	A	A	E	A	1
	Learning	A	A	A	A	A	A	0
	Teaching	E	A	A	B	E	E	5
HF	Teaching Philosophy	R	R	A	B	E	A	9
	Learning	A	A	A	A	A	A	0
	Teaching	A	A	A	A	A	A	0
MH	Teaching Philosophy	E	A	A	A	A	A	1
	Learning	A	A	A	A	A	A	0
	Teaching	-	-	-	-	-	-	-
LS	Teaching Philosophy	E	A	A	A	A	A	1
	Learning	A	A	A	A	A	A	0
	Teaching	A	A	A	A	A	A	0
	Total	19	9	5	14	15	4	

Note: A = absence (0); E = emerging (1); B = building (2); R = realisation (3); - missing content in the eportfolio

4.2 Teaching practicum:

We had expected more B (identity building) or R (identity realisation) level for teacher identity in the *practicum* category, as the emergence of teacher identity should be more evident after the student teacher had gone through the teaching practicum. This, however, was only observed in some participants. For example, JL used the trekker analogy to describe how his contemplation on the evolving situation helped his continuous identity development, which increased his assessment score to the realisation level:

I would link the importance of keeping myself physically fit to undertake such tasks to keeping myself updated with content and current affairs knowledge of the subjects I am teaching. The wrong shoes worn also made me realise the importance of choosing the right equipment for the right activity. Therefore, it would be good to be ascertain which method would be more appropriate than the other. [JL]

Compared to JL, PN was scored at the emerging level for the continuity of teacher identity as seen in her quote below, because she did not involving any reasoning or supporting evidence to consolidate her understanding of her identity as teacher:

I need to update and continue to review my teaching pedagogies. After all, teaching has evolved tremendously since my student days. [PN]

JY also noted the multiple roles that a primary school teacher can take on. More interestingly, this example also showed the individual nature of identity, whereby JY maintained a clear sense of identity although he also acknowledged the negative side of this profession (e.g., being overwhelmed). It was scored at the emerging level because JY could have elaborated on his reasoning on how his identity was secured with both positive and negative sides of the profession:

As a primary school teacher, you are not just the students' teacher, you are their care-taker, confidante and role model. It was certainly an overwhelming role; nonetheless, meaningful and purposeful.... It rendered me a sense of satisfaction even though teaching children is mentally and physically exhausting. [JY]

Both JL and PN demonstrated emerging evidence of the social nature of their identity wherein significant others (such as mentor) in their life were noted as influencing factors of forming their teacher identity:

I'm thankful of my mentor Mdm Khoo and informal mentor Mr. Khoo for their time, effort, advices, encouragement to help me grow.... I'm extremely encouraged to see teachers with such passion and focus on students' learning, while remaining humble and yearn to learn from others... [PN]

Discussion and conclusion:

Examination of prospective teachers' perceptions about their teacher identity and tracking the development of these perceptions in light of academic and field-based experiences is a critical task for teacher educators. As pre-service teachers are in a state of transition, their identity is thus perhaps unstable or unpredictable. This in turn presents difficulties for effective assessment of this construct. Our results suggested that student teachers' teacher identity can be described and interpreted by Akkerman and Meijer (2011) framework. The rubric we developed based on this framework is applicable for teacher identity assessment. Besides its utility as a measurement instrument, the rubric has potential to benefit teacher education institution in terms of directing their attention towards fostering teachers with a positive and firm identity, aside from equipping pre-service teachers with necessary knowledge and skills. Use of such a rubric would provide consistency of assessing student teachers' identity across multiple courses within a teacher education programme. Our results also showed that eportfolios did provide a platform for student teachers to articulate their identities, as their experience and reflection of the experience in the eportfolios represented a means for the reification of their identities as the type of teachers they wanted to be [28].

As Haviland and Kahlbaugh [13] argued, one's identity is flexible and pragmatic, which allows the individual to adapt to different situational contexts that arise concurrently or developmentally. A teacher's identity is shaped and reshaped in interaction with others in a professional context [4]. By examining the artefacts in different contexts (learning versus teaching), we were able to seek similarities and dissimilarities of each participant in terms of his or her teacher identity development. The results showed a contextual effect on such development in four of the seven participants (see Table 2). Among them, three showed stronger characterisation of their teacher identity in the teaching practicum context relative to the learning context in various dimensions. This was not surprising as the actual teaching practice offered an opportunity for student teachers to experiment their knowledge and the challenges from real life pushed them to be more aware and reflective of their role as a teacher. However, JY showed a weaker characterisation of his identity in teaching practicum. Based on the amount of information included in his eportfolio in this section, one possible reason could be the overwhelming workload in the teaching practicum which could lead to the reduced reflection of his teaching as shown in his eportfolio composition. Another possible explanation was that the identity formed during coursework could also have been undermined by the teaching practicum, because of the changed situation (from a student to a practicing teacher). The rest three did not show much contextual effect on their teacher identity. Further reasons need to be probed in future studies.

This study has a few limitations. First, the small sample size presents challenges when interpreting the results, although the main purpose of using the seven eportfolios was to illustrate the applicability of our rubric. Second, no other types of data were collected for the purpose of triangulation for us to better gauge the effectiveness and accuracy of the rubric in this exploratory research. In future studies, other research methods such as focus-group interviews, surveys, or observations can be incorporated to improve the reliability and validity of the findings. This is planned in the next stage of the project. Third, there were no specific directions for the entries of the eportfolios in this project, as we intended to provide autonomy for student teachers to construct a portfolio that truly represents themselves. Some student teachers tended to connect what they were experiencing to their identity construction in an explicit way. We believe this explicitness, as shown in their artefacts, encourages more thinking and behaving as a professional. However, most of the participants included a substantial part of their teaching plan and academic progression in their eportfolios to show what they have achieved. This, standing alone, could not be construed as part of their identity as there was no connection between the person and the artefact, which does not allow us to make inferences. One could argue that the failure to upload identity-related artefacts did not necessarily mean they suffer from a vague, weak or undefined

teacher identity. One of the participants in Klecka *et al.*'s [16] study also raised such concerns of how the artefacts documents (or lack of thereof) reflect one's "essence as a teacher educator" (p. 86). In the present study, we did not stress to participants what to include. In other words, the artefacts gathered in present study were very much explorative in nature. Thus, we were also reminded that our interpretations are limited to what we can observe and infer. As the dialogical approach of identity focuses on the personal aspect, more information could possibly be collected if the eportfolio entries were directed to focus on reflecting upon one's thoughts and behaviour with regards to being teacher.

Table 2: Teacher identities across context.

Subject	Learning Journey	Teaching Practicum
JY	Strong characterisation of teacher identity in all six dimensions	Less strong characterisation of teacher identity in all six dimensions
JL	No characterisation of teacher identity in any dimension	Building teacher identity in multiplicity and social dimensions
YZ	No characterisation of teacher identity in any dimension	Emerging teacher identity in multiplicity and social dimensions
PN	No characterisation of teacher identity in any dimension	Emerging teacher identity in multiplicity, continuity, social and individual dimensions
HF	No characterisation of teacher identity in any dimension	No characterisation of teacher identity in any dimension
MH	No characterisation of teacher identity in any dimension	Missing content in the eportfolio
LS	No characterisation of teacher identity in any dimension	No characterisation of teacher identity in any dimension

Despite the limitations aforementioned, the present study offers opportunities for further research which combines recent topics. One possibility for expanding the present study in future research lies in the investigation of teachers' identity construction from multiple angles and inclusion of the voice of different stakeholders such as teacher educators, school authorities, and in-service teachers, who play an important role in the identity construction experiences of pre-service teachers. Second, given the commonly agreed notion of teacher identity as a developmental construct, longitudinal studies are warranted to examine the developmental process of teacher identity to shed light on the developmental patterns of one's identity along each dimension in teacher education programmes. Third, the framework we adopted and the rubric we developed only represented one way of understanding teacher identity. There are other conceptualisations of teacher identity and other ways of operationalising this construct. We encourage future research that could extend this study by considering alternative models or frameworks.

Authors' Contribution:

Dr. Mingming Zhou and Dr. Stephanie Chye conceptualized the study and played an important role in the result and discussion section. Mr. Yek Wei Chong was mainly in charge of data collection and analysis. Dr. Caroline Koh and Dr. Woon Chia Liu provided valuable feedback to the whole paper.

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